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### Vanillin.

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Vanillin (4-hydroxy-3-methoxybenzaldehyde) is an important flavour and arom molecule, but is also of interest because of its biogenetic relationship to the phenylpropanoid pathway and to other molecules of physiological significance, notably salicylate. Recent progress towards characterisation of the biosynthesis vanillin is reviewed. In Vanilla, there is some evidence that the route to vanillin-beta-D-glucoside may proceed from 4-coumaric acid via 4-hydroxybenzaldehyde, with glucoside formation occurring not necessarily as final step, and possibly with the involvement of 4-hydroxybenzyl alcohol beta-D-glucoside tartrate bis-esters as "shunt" metabolites. This appears to be given tentative support by the recent partial characterisation of a 4-hydroxybenzaldehyde synthase from Vanilla. On the other hand, a well-characterised, CoA-dependent, non-oxidative chain-shortening mechanism produce vanillin from ferulic acid, occurring as part of a pathway of hydroxycinnamate degradation in Pseudomonas, may not be representative of hydroxycinnamate chain-shortening mechanism(s) occurring in Vanilla and other plants. Nevertheless, by expression of the Pseudomonas enzyme 4-hydroxycinnamoyl-CoA hydratase/lyase (HCHL), attempts have been made to introduce a direct capacity for vanillin formation into model plants by diversion the phenylpropanoid pathway. The results obtained have emphasised the obstacles to achieving the desired oxidation level (aldehyde) and ring substitution (4-hydroxy-3-methoxyphenyl), even when a substantial metabolic diversion is successfully achieved. Finally, the significance of the latest biosynthetic and biotechnological developments is reviewed briefly in relation to authentication of vanillin.

#### Publication Types:

- Review
- Review, Tutorial

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